REMARKS

In the Advisory Action of November 3, 2008, it was stated that the request for consideration has been considered but does not place the application in condition for allowance. Several reasons were cited.

First, it was stated that although Applicants have argued that Al-Si foundry alloys do not recrystallize, and therefore there is no motivation to add V to the alloy of Tamamura, the reference "Aluminium and Aluminium Alloys" teaches nevertheless that V can be used as a grain refiner. The reference GB '282 is also cited as teaching that V can be used as a grain refiner in Al-Si alloys.

It was further noted that Applicants had not presented specific evidence regarding the assertion that the presence of vanadium may be detrimental to grain refinement in Al-Si foundry alloys.

It was also noted that Applicants had not shown specific unexpected results regarding the addition of vanadium in improving creep strength of the claimed Al-Si alloys.

Applicants now present two declarations containing both evidence and opinions to support the arguments made in the Amendment filed on September 10, 2008.

The first point discussed is the question of whether the addition of vanadium can be expected to improve grain refinement, as is alleged based upon the "Aluminum and Aluminum Alloys" reference.

The declaration of Stèphane Vernéde is submitted to establish experimentally that the addition of vanadium to a type AA3104 aluminum alloy in amounts of 100, 200 and 400 ppm *increases* grain size with respect to an alloy which does not contain a vanadium addition. Accordingly, contrary to the statements made in the cited reference, vanadium does not act as a grain refiner in Al-Si foundry alloys, and anyone of ordinary skill in the art adding vanadium for this purpose to the claimed alloys would find vanadium to be unsatisfactory

for the cited purpose. Hence, one relying on the cited references for improvement of grain refining of Al-Si alloys would dismiss the claimed alloys as unacceptable.

While AA3104 is not an alloy according to the claimed invention, it is noted that the cited reference is not directed to the alloys of the claimed invention but to aluminum alloys in general, and the argument in the several Office Actions must therefore be directed to aluminum alloys in general, and not to the claimed alloys in particular. Since the arguments presented in the Office Actions are not directed to the claimed alloys, Applicants submit that the evidence also need not be directed to the claimed alloys, and the declaration of Dr. Vernéde therefore serves to effectively rebut the general proposition set forth in the reference that vanadium is a grain refiner.

The addition of vanadium does, however, improve creep strength, as is established in the enclosed declaration of Michel Garat, a named inventor of the application. In the Garat declaration, creep strength was measured by two different methods, with the results reported in Tables 1 and 2, respectively. The alloys tested had a vanadium content of 0, 0.17%, 0.21% and 0.27%, the latter values being distributed through the claimed range of 0.04-0.30%. It can be seen from Tables 1 and 2 that the addition of vanadium improves creep strength in comparison with the alloys which do not contain vanadium.

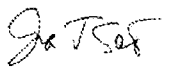
The declaration of Garat also contains an explanation as to why vanadium does not act as a grain refiner in the alloys of the invention, stating that while vanadium is a potential grain refiner, the most universal method of grain refinement is to add a combination of titanium and boron resulting in the formation of TiB_2, which is the most effective nucleant of alpha-aluminum. In wrought alloys which do not contain silicon, only a small amount of Ti is needed, combined with boron. However, in Al-Si alloys which contain between 5 and

11% by weight silicon, a much greater amount of Ti is needed, since part of the Ti is combined with Si. When vanadium is present, part of the boron is entrapped in chemically stable VB_2 compounds with poor grain refinement ability. Consequently, when vanadium is added to a silicon-containing alloys as are presently claimed, which also contain Ti and B, the grain refinement is actually reduced.

Applicants note here that the alloys of the invention contain both vanadium and titanium; boron is added at the remelt stage for purposes of grain refinement. This method is the state of the art in the foundry industry, although boron is not discussed in the present specification because it is not incorporated into the alloy prior to remelt. The TiB_2 crystals, which work as nuclei for the solidification of the primary Al phase, form rapidly after Ti and B come into the presence of each other and later tend to progressively coarsen, decrease in number and settle. Consequently, it is better to add the boron- containing agent at the latest stage of the process possible.

Given the state of the prior art, the reduction in grain refinement which has been established is unexpected, and the improvement of creep strength is also unexpected. Having established unexpected properties for the alloys of the invention, withdrawal of the rejections of record is requested.

Respectfully submitted,



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